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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/995,433	11/27/2001	Donald Ray Bloyer	1834.135US1	9787
7590	03/10/2004			
DAVID LUCENTE SEAGATE TECHNOLOGY INTELLECTUAL PROPERTY DEPT. COL2LGL 389 DISC DR. LONGMONT, CO 80503			EXAMINER MILLER, PATRICK L	
			ART UNIT 2837	PAPER NUMBER
DATE MAILED: 03/10/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/995,433	Applicant(s) BLOYER ET AL.	
	Examiner Patrick Miller	Art Unit 2837	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 December 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 7-24 and 28-30 is/are rejected.
- 7) ☒ Claim(s) 4-6 and 25-27 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claims 5, 10, and 16 are objected to because of the following informalities: See bullets below. Appropriate correction is required.
 - Claims 5 and 10 cite the step “(b)(i).” This step is already cited in claim 2.
 - Also note, should claim 9 be amended to depend from claim 3, it too has a step “(b)(i),” which is already cited in claim 2.
 - Claim 16 discloses “the disc storage device” (line five of claim). Lack of antecedent basis for this term. Line two of this claim was amended to say “a storage device.”

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 9 is rejected because it recites the limitation "a modulating step." There is insufficient antecedent basis for this limitation in the claim. Claim 2 discloses a modulating step. Currently, claim 9 is depends from claim 13.

Response to Arguments

3. Applicant's arguments filed on 12/15/03, with respect to claims 12 and 28 (pg. 10 of 11, third full paragraph) have been fully considered but they are not persuasive.
 - Figure 1, #3 of Oida (6,429,997) is a spindle motor.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-3, 11, 16, 23, 24, 29, and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Dunn et al (5,473,230).

- With respect to claim 1, Dunn et al disclose a method comprising the steps of directing current to a motor (fig. 1, #17 provides current to #18), and modulating the current in reference to interference between a head and a surface (cols. ¾, lines 63-67/1-26).
- With respect to claim 2, the modulating step modulates the current in reference to a predetermined profile (col. 4, lines 28-34; table).
- With respect to claim 3, the motor is associated with a spindle and the surface is a disc, wherein the disc and motor are part of a storage device (col. 2, lines 64-66).
- With respect to claims 11 and 30, the torque correction means of Dunn et al increments the current supplied to the current, and therefore increases the current (col. 2, lines 29-36).
- With respect to claim 16, Dunn et al disclose a method for dynamically modulating current based on dynamic performance during operation of a storage device, the method comprising: determining interference between a head and a storage medium in reference

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to a performance profile (col. 2, lines 29-33; current profile is stored in a look-up table), and in reference to dynamic performance during operation (fig. 1, dynamic performance is the velocity error); and modulating current to the disc in reference to said interference (col. 2, lines 34-41).

- With respect to claim 23, Dunn et al disclose an apparatus for controlling a spindle motor of a mass storage device, the apparatus comprising: A recording medium (col. 2, line 8; disk), a spindle motor attached to the recording medium (col. 2, line 4; spindle motor), a modulator that is coupled to the motor and modulates current to the motor to avoid anomalies (fig. 1, control circuitry modulates current to #18).
- With respect to claim 24, the predetermined profile can also be based on a plurality of times (col. 5, lines 40-52).
- With respect to claim 29, Dunn et al disclose an information handling system to control a spindle motor of a mass storage device comprising: a rotatable recording medium (col. 2, line 8; disk), a spindle motor (col. 2, line 4; spindle motor), a processor (fig. 1, circuitry), a head (col. 2, line 9), and a means to modulate the current to the motor so that interferences between the head and recording medium are reduced (cols. 3/4, lines 63-67/1-26).

5. Claims 12 and 28 are rejected under 35 U.S.C. 102(e) as being anticipated by Oida (6,429,997).

- Oida discloses a method for generating a profile of modulated current of a spindle motor of a mass storage device, the method comprising: receiving performance data of the mass storage device, the data including spindle motor current and at least one

performance measurement (fig. 2, receives position and speed info.), determining a portion of the performance data that indicates inadequacy and exceeds a predetermined threshold (col. 8, lines 52-63), and generating a profile in reference to the performance inadequacy (col. 8, lines 63-65).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dunn et al as applied to claim 1 above, and further in view of Smith (6,574,754).

- Dunn et al do not disclose modulating the current in reference to a predetermined profile, where the profile reduces air-bearing instability and takeoff air-bearing instability.
- Smith discloses modulating the current from a profile, where the profile reduces takeoff air-bearing instability (from beginning of a seek operation). The motivation to compensate for air-bearing instability is detect resonance between the head and disc. This provides the advantage of allowing the system to attenuate certain resonant frequencies that degrade system performance (col. 9, lines 25-41).
- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the apparatus of Dunn et al so the apparatus reduces the takeoff air-bearing instability, thereby providing the advantage improved system performance, as taught by Smith.

7. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dunn et al as applied to claim 1 above, and further in view of Ogino (5,768,226).

- Dunn et al do not disclose modulating the current during spin-down.
- Ogino discloses disturbances that occur when the motor stops (spin-down), and attenuating the disturbances (modulating the current). Ogino also discloses attenuating these disturbances that occur when the motor stops. This provides the advantage correcting the seek function on the basis of a more accurate velocity (col. 2, lines 42-67 and col. 6, lines 1-17).
- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention that apparatus of Dunn et al could modulate the current during spin-down, thereby providing the advantage of correcting the seek function, as taught by Ogino.

8. Claims 11 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dunn et al as applied to claims 1 and 29 above, and further in view of Okada et al (6,249,495).

- Dunn et al do not disclose significantly increasing current when a disturbance between the head and disc occurs.
- Okada et al disclose a means for increasing the current in reference to a large disturbance. The motivation to increase the current is to send a signal to the rest state of the controller. This provides the advantage of stopping head at the current position until the disturbance has sufficiently subsided (col. 23, lines 39-67).
- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention that apparatus of Dunn et al could be modified to increase current when a

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more significant disturbance is detected, thereby providing the advantage of stopping the head until the disturbance has stopped, as taught by Okada et al.

9. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oida as applied to claim 12 above, and further in view of Smith (6,574,754).

- Oida does not disclose modulating the current in reference to a predetermined profile, where the profile reduces air-bearing instability and takeoff air-bearing instability.
- Smith discloses modulating the current from a profile, where the profile reduces takeoff air-bearing instability (from beginning of a seek operation). The motivation to compensate for air-bearing instability is detect resonance between the head and disc. This provides the advantage of allowing the system to attenuate certain resonant frequencies that degrade system performance (col. 9, lines 25-41).
- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the apparatus of Oida so the apparatus reduces the takeoff air-bearing instability, thereby providing the advantage improved system performance, as taught by Smith.

10. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oida as applied to claim 12 above, and further in view of Dunn et al (5,473,230).

- Oida discloses storing a profile in memory (burning), but does not disclose measuring the drag and speed for performance data.
- Dunn et al disclose an apparatus that detects drag and speed of a spindle motor for a disc drive. The motivation to measure the speed and drag is to produce a velocity error that is

put into a compensation control loop. This provides the advantage of reducing the disturbance's effect on the apparatus (col. 4, lines 1-27).

- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the apparatus of Oida as described above, thereby providing the advantage of reducing the disturbance's effect on the apparatus, as taught by Dunn et al.

11. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dunn et al as applied to claim 16 above, and further in view of Oida (6,429,997).

- Dunn et al do not disclose measuring the speed of the disc at start-up, comparing the speed to a look up table, and interference is indicated if the speed does not meet the predetermined value.
- Oida discloses measuring the speed of the disc (via an integrator) (fig. 3, output of 29b; col. 4, lines 3-5), comparing the speed to a speed profile (look up table) (fig. 4, ST5), and determining that interference has occurred if the two speeds do not match-up (ST6). Oida's motivation for doing such is so computation is eliminated. This provides the advantage of simplifying the setting of the speed profile (col. 4, lines 42-47).
- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention that apparatus of Dunn et al could be modified as described above, thereby providing the advantage of simplifying the setting of the speed profile, as taught by Oida.

12. Claims 18-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dunn et al as applied to claim 16 above, and further in view of Yamashita et al (6,157,599).

- Dunn et al do not disclose measuring the time per revolution and comparing the time per revolution to an expected time, and if different indicates an interference. Li also does not disclose sampling the acceleration, comparing the acceleration to a last sample, sampling the acceleration at each revolution, at multiple revolutions, and at sub-multiple revolutions.
- Yamashita et al disclose measuring latch timing (time per revolution) and comparing it to an expected latch timing. Yamashita et al also disclose sampling acceleration, comparing the acceleration to a last sample, and the sampling is variable, which means the sampling could be set to any of the above conditions. The motivation to determine the sample the acceleration as described is to determine a zero-cross error has occurred. This provides the advantage of calculating a prediction speed (cols. 19/20, lines 60-67/1-62).
- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention that apparatus of Dunn et al could be modified as described above, thereby providing the advantage of calculating a prediction speed, as taught by Yamashita et al.

Allowable Subject Matter

13. Claims 4, 5, 6, and 25-27 are objected to as being dependent upon a rejected base claim, but would be allowable if the minor informalities are corrected and rewritten in independent form including all of the limitations of the base claim and any intervening claims.

- With respect to claims 4 and 25, the Prior Art does not disclose controlling a spindle motor by monitoring a lapse of time, wherein the lapse of time represents the amount of current to modulate the motor when an interface between the head and disc occurs.
- With respect to claim 5, the Prior Art discloses interference thresholds, that once exceeded, current is stopped to the motor. The Prior Art does not disclose modulating current to a spindle motor when an interference threshold has been exceeded.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick Miller whose telephone number is 571-272-2070. The examiner can normally be reached on M-F, 8:30-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Nappi can be reached on 571-272-2800 ext 37. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9318.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-3431.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Patrick Miller
Examiner
Art Unit 2837

pm
February 29, 2004


ROBERT NAPPI
SUPERVISORY PATENT EXAMINER